Dragon Name: _____

Name:_____ Date:_____ Block: _____

Dragon Lab

OBJECTIVES:

The purpose of this lab is to:

(1) Illustrate the processes of transcription and translation.
(2) Understand the relationship between a codon, an anticodon, and an amino acid.
(3) Determine the phenotype of your dragon based on its DNA sequence.

MATERIALS:

Copy of the Lab	DNA Worksheet	Dragon Template
Pencil	Amino acid chart	Colored pencils

PROCEDURE:

(1) Look at your DNA Worksheet. There are 8 strands of DNA sequences. Each DNA strand corresponds to a particular gene, which in turn corresponds to a particular protein that is responsible for a particular phenotype of a given trait. The traits are: coat color, eye color, fire, tail, horns, wings, teeth and claws.

(2) **Transcribe** the DNA strand into its corresponding messenger RNA (mRNA) strand according to the base pairing rules discussed in class. Record your strand on the DNA worksheet.

(3) Each triplet of bases on the mRNA strand is called a **codon**. Every codon has a corresponding **anticodon** that is found on the transcription RNA (tRNA). We will not write them out for this lab BUT do not forget they play an important role in the translation process. Please note tRNA helps to bond the correct amino acid to the polypeptide chain.

(4) When the tRNA attaches temporarily to the mRNA at the ribosome, it brings with it a corresponding amino acid, which will link together to form a chain. This process is called **translation**. The chain of amino acids is what creates a protein. Using the amino acid chart, translate the mRNA into a chain of amino acids. *(Hint: Look for the start codon. Begin translation at the start codon and end at the stop codon. You do not need to translate the entire string, just the segment that corresponds to the protein.)*

(5) The proteins that are produced (or not produced) are what control the phenotype. Using the trait key on the next page, write the phenotypes of the 8 traits that will be portrayed in your dragon.

(6) Take out your Dragon Template. Draw in your phenotypes of your dragon in pencil. Make sure to depict all eight traits.

(7) Using markers, crayons, or colored pencils color in your dragon template.

(8) Answer the Dragon Lab Conclusion Questions.

(9) When finished, check over your work. Please staple the DNA Worksheet, Dragon Lab Conclusion Questions and the Dragon Template to this paper and submit.

Dragon Name: _____

Dragon Lab Trait Key

Trait	Amino Acid Chain – Protein	Phenotype
Coat Color	Met-Phe-Leu-Val-Met	Solid coat
	Met-Phe-Phe-Val-Met	Spotted coat
Eye Color	Met-Ser-Asn-Val-Arg	Blue eyes
	Met-Ser-Val-Arg	Green eyes
	Met-Asn-Asn-Val-Arg	Red eyes
Fire	Met-Pro-Leu-Gly-Gln	Yellow Fire
	Met-Pro-Leu-Ala-Gln	Blue Fire
	No Protein	No Fire
Tail	Met-Pro-Thr-Asn-Glu-Ala	Spiked Tail
	No Protein	No spikes on Tail
Horns	Met-Val-Gly-His-Gln	Double Horns
	Met-Val-Gly-Trp-His-Gln	Single Horns
	No Protein	Hornless
Wings	Met-Gly-Arg-Gln-Asp	2 pairs of Wings
	Met-Arg-Gln-Asp	1 pair of Wings
	No Protein	Wingless
Claws	Met-Lys-Tyr-Arg-Thr	Long Claws
	Met-Lys-Phe-Arg-Thr	Short Claws
Teeth	Met-Phe-Asn-Glu-Arg-Leu-His-Pro	Short, Square Front Teeth
	Met-Leu-Asp-Glu-Arg-Leu-His-Pro	Long, Sharp Front Teeth

Dragon Name: _____